

15 MILE CREEK & ELK CREEK LANDSCAPE RESTORATION PROJECT

Ashland Ranger District, Custer National Forest
Powder River County, Montana

Project Area

The 15 Mile and Elk Creek (15 Mile) project area is located approximately 10 miles south of Ashland, Montana in Powder River County, Montana. The project area includes the 15-Mile and Elk Creek watersheds in Township 5 South, Ranges 46 and 47 East, and Township 6 South, Ranges 46 and 47 East. The project area encompasses 28,391 acres, of which 24,815 acres is National Forest, and the remainder is privately owned. **See Map 1 – Vicinity Map.** The 15 Mile and Elk Creek Watersheds are roughly bisected into thirds by two stringers of private lands that run west to east along the valley bottoms of 15 Mile and Elk Creeks (**Map 1**). The valley bottoms contain homes and outbuildings, and are the livelihood of local ranching families.

Approximately 40 percent of the project area is forested and the remainder is grassland. Ponderosa pine hills rise in elevation from the valley bottom in a series of ridges and draws, and end at flat grassland plateaus that are extensively used for livestock grazing by area permittees (**Figure 1**). The juxtaposition of forest and grassland creates a mosaic pattern of forest/nonforest across the landscape. Large interior patches of forest are generally not as prevalent as they are on the northern portion of the District (example: Beaver Creek). Woody draws and riparian areas located in valley bottoms and ephemeral drainages comprise a very small portion of the landscape (less than 1%).

The 15 Mile Road serves as the primary access point into the project area. It runs along the valley bottom of the 15 Mile Creek watershed and is maintained by Powder River County. There are a number of CNF system routes that provide motorized access within the project area. Many of these routes are little more than two track routes crossing grasslands (**Figure 1**). Access to the southern portion of the project area is somewhat limited by private lands in the Elk Creek drainage. There are also a number of administrative routes used intermittently by the Forest, and non-system routes that were identified as decommission opportunities under the 2009 Ashland Travel decision.

Figure 1: Overview of project area. Dispersed patches of forest separated by a large grassland plateau. Access to the area via is provided by the two-track dirt road. Photo by Mark Nienow (7.28.11).



Background

Following the 2000 fire season, Congress directed the Forest Service to identify high-risk wildland/urban interface areas. In 2002, Powder River County, the Broadus Volunteer Fire Department, State and Federal Agencies began working together to identify wildland fire risks, and identify areas in need of vegetative management activities to reduce undesirable fire effects, particularly in forested environments. This collaborative effort resulted in the 2004 Powder River County Wildfire Protection Plan (PRCWPP), which identified the 15 Mile and Elk Creek drainages as the second highest priority for fuels reduction in Powder River County (Beaver Creek area was No. 1). This collaborative effort and the resulting PRCWPP compelled the Forest Service to evaluate and prioritize the 15 Elk project area for fuels reduction treatment. The 15-Elk project was originally scoped in February 2008 as a Healthy Forest Restoration Act (HFRA) project. The proposed action as scoped in 2008 proposed extensive fuels reduction through treatment of 4,942 acres through commercial logging and prescribed fire, and treatment of an additional 9,577 acres by prescribed fire only. The proposed action would have required 41.8 miles of temporary roads. An environmental analysis was started, but not completed, and no decision was ever made. The 2008 proposed action was withdrawn in 2011.

Recently, the CNF reviewed previous work on the 15-Elk project, and reassessed the project's purpose and need. The Forest determined that fuels reduction should remain part of the purpose and need, but that there are other land management activities needed to address forest and watershed health/restoration. The project area was expanded from a road based boundary to a watershed boundary encompassing two 6th Code HUCs (15 Mile and Elk Creek watersheds).

Purpose and Need for Action

The purpose of the 15 Elk Landscape Restoration project is to:

1. Manage forest vegetation to restore and improve resiliency of a fire-adapted ecosystem.
2. Improve the diversity and quality of hardwood draws and riparian/aquatic habitat.
3. Decommission roads in accordance with the 2009 Ashland Travel decision.

Each of these components of the purpose and need are detailed below.

Manage forest vegetation to restore and improve resiliency of a fire-adapted ecosystem.

The *forested* portion of the project area is generally dominated by either dense stands of young ponderosa pine as a result of past fires over the last 50 years, or stands of mid and late development closed canopy stands of ponderosa pine, both of which are susceptible to stand replacement wildfire. There is a need to thin young stands to reduce competition, enhance growth and vigor, and enhance their ability to grow into mature forest over time. There is also a need to reduce ladder fuels and increase tree spacing in mature forest stands to lessen the risk of stand replacement fire, and maintain existing mid aged and mature forest into the future. There is also a need to create a diversity of early, mid and late development open forest structural classes that promote historic disturbance regimes and processes on the landscape. Managing forested areas for a variety of successional stages that are spatially distributed across the project area will mimic historic conditions that are more resistant to large scale, stand replacement fires.

The need for fuels reduction in the project area was identified in the 2004 Powder River Community Fire Plan. In addition, forest and fuels management responds to Forest Plan forest-wide management standards to maintain a variety of age classes (Forest Plan, page 24), implement management activities that consider threats to life and property, public safety, and resource values (Forest Plan, page 38), and considers natural fire cycles in fire-dependent ecosystems when preparing resource management prescriptions (Forest Plan, page 38). Forest management is also driven by the need to maintain, enhance, and/or improve habitat for a variety of wildlife species now and into the future. Lastly, forest management addresses a need to provide wood products, and provide sustainable environmental, social, and economic benefits.

Management actions that increase vegetative diversity and improve fire resiliency are driven by the need to:

- Change fire behavior to provide for lower severity/intensity fires as a natural ecosystem function instead of stand replacement fire
- Respond to the Community Wildfire Protection Plan
- Protect values at risk (private in holdings including structures and crop lands).

Forested areas on the Ashland District, including the 15 Elk area, have an extensive predominance of Ponderosa pine (*Pinus Ponderosa*) that occur in rather diverse habitat types.

The driest of these forest types have very open stands with short trees (35-60 feet tall) and a grass understory. Moist north-facing slopes have dense stands of Ponderosa Pine (70-95 feet tall), with abundant shrub and herb undergrowth.

Ponderosa pine forests are a fire adapted ecosystem, which means that frequent fires maintained an open forest structure and prevented tree encroachment into grasslands. A historic fire interval on the Ashland District may range anywhere from four to 42 years (Black Hills Potential Natural Vegetation Group - PNVG and Sneed, 2005). These frequent fires would generally have burned at low intensities, and would have cleared ponderosa pine forests of brush and grass but left trees alive and healthy. The majority of the landscape was comprised of relatively open canopy stands, and stand replacing fire events were uncommon. High severity burning (greater than 75% mortality of the overstory trees) was limited to the closed canopy of mid and late development structure classes or during times of extended drought.

However, fire has largely been excluded from the landscape due to decades of fire suppression policies, resulting in a buildup of fuel loads that burn as a stand replacement fire. Over the past 15 years, roughly two-fifths of the Ashland RD has experienced stand-replacing wildfire. These large wildfires have removed broad landscapes of Ponderosa pine forests along with public and private infrastructure. Fire suppression activities, drought and other activities have resulted in greater tree densities and a buildup of down woody material and ladder fuels across large areas of the forest landscape. These changes have created a mechanism for surface fires to develop into intense stand replacement crown fires. In the past 25 years, several large, high intensity fires occurred on the Ashland RD including the Willey Fires, Stag-Tobin Complex, Schiller Fire, and the Diamond Complex.

All of these large fires exhibited extensive stand replacement across the landscape and were difficult to control due to increased intensities, spotting, and spread rates of large scale crown fires. The combined Stag – Tobin fires eventually totaled over 69,000 acres on the Ashland District and adjacent lands. Although the fires were large, they were not all consuming. The fire burned in a mosaic patterns that reflect interspersed pines and grasslands. However, the Stag area experienced high fire intensity resulting in 95-100% vegetation mortality across more than 50% of the landscape. Additional high intensity, stand replacement fires have occurred in similar ponderosa pine ecosystems elsewhere on the Custer National Forest, including the 1988 Brewer Fire and 2002 Kraft Springs Fire on the Sioux Ranger District.

During the 2011 fire season, several fires referred to as the “The Diamond Complex” burned a total of 52,715 acres on or near the Ashland District, Custer National Forest. Of the 52,715 acres, 12,946 acres burned on the Forest, and 39,769 acres burned on BLM, state, and private lands. The Diamond Complex included the Mill, Little Fork and Maverick Fires. The Mill fire burned on the north end of the Forest (6,950 acres with 6,347 on the CNF). The Little Fork and Maverick Fires burned on the south end of the Ashland District. The Little Fork Fire burned 34,555 acres (2,706 acres on the CNF), and the Maverick Fire burned 11,210 acres (3,893 acres on the CNF). Less than one-third of these fires were mapped as high intensity; however post fire mortality over the next two to five years in these areas is currently unknown.

Vegetation treatments that are proposed in the 15 Elk project area may enable natural ignitions to be used as a management tool, resulting in wildfires that are lower in severity/intensity, fires that are less severe under drought conditions, and fires that are smaller in size (historically, "large fires" were maxing out at 3000-8000 acres). Note that the 2011 fires burned 39,769 acres off

forest, and that land management on the CNF has resource implications that extend well beyond the Forest boundary.

Past Wildfires in the Project Area

The Custer National Forest reviewed the fire history of the 15 Elk project area. There have been over 25 fire starts in the project area, and approximately 30 percent of the project area has burned since 1966. See **Map 2 – Fire History**. Wildfires events in the project area included:

- 1966 - Cow Creek Fire – Estimated at 4,430 acres
- 1982 - Jacob Fire - 15 acres
- 1989 - The Forest Fire - 825 acres
- 2005 - Willey Fire – 5,405 acres total (2,230 acres in project area)

The larger fires burned at high intensities. The 1966 Cow Creek Fire burned in the southern portion of the project area in the Elk Creek watershed. While the exact fire perimeter is unknown, the CNF reviewed aerial photography and performed field reconnaissance to identify areas that burned at moderate or stronger intensities. See **Map 2**. Areas that may have burned at lower intensities that left a mature overstory may not be included within the mapped boundary. Site conditions include a variety of conditions, including dense stands of single story young trees, two story stands with a dense understory and remnant overstory, and stands of mid aged or older trees. See **Figures 2- 5**.

Figure 2: Young stand; Cow Creek Fire. Photo by Amy Waring (9.21.11)

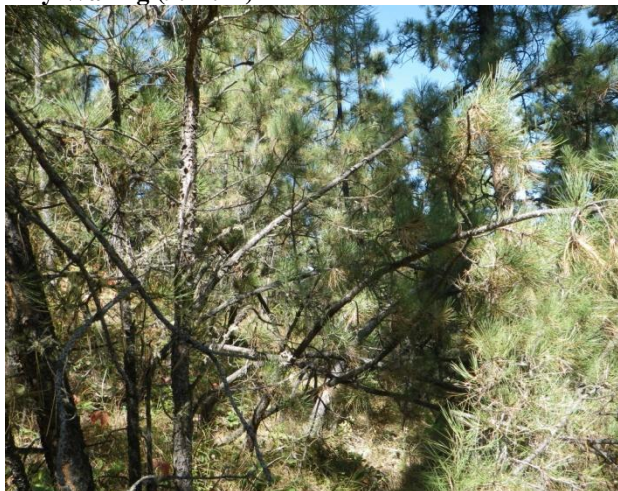


Figure 4: Young stand. Photo by Matt Sonsteng (6.30.11)



Figure 3: Two storied stand; Cow Creek Fire.
Photo by Matt Sonsteng (6.30.11)



Figure 5: Two storied stand; Cow Creek fire.
Photo by Amy Waring (9.21.11)



The Forest Fire (1989) burned in the northwestern portion of the project area in the 15 Mile watershed. Based on field reconnaissance and photo interpretation, this area is regenerating slowly at high densities (**Figures 6 – 8**). The management objective in these areas is to increase tree spacing between trees, which will allow the stand to progress into mid open development stands.

Figure 6: The Forest Fire (1989). Photo by Dennis Sandbak (8.5.11).



Figure 7: The Forest Fire (1989). Photo by Dennis Sandbak (8.5.11).



Figure 8: The Forest Fire (1989). Photo by Dennis Sandbak (8.4.11).



The 2005 Willey Fire burned in the northwestern portion of the project area in the 15 Mile watershed, as well as to the north of the project area in the 10 Mile Creek watershed. Based on field reconnaissance and photo interpretation, this area is experiencing delayed natural regeneration. FS personnel are monitoring regeneration in the area. The management objective is to allow the area to recover naturally to meet the Forest's stocking objectives; no additional management activities are proposed at this time.

In addition, an additional 233 acres in the project area has burned via natural fuels, slashing, or burn treatments since 1989.

All of the burned areas are within or just on the outside edge of a natural fire interval (4 to 42 years). Future management is needed to maintain forest health, increase trees spacing, maintain historic range of fire intervals, improve resiliency to fire, and provide for natural ignitions to be used in a manner that results in smaller fires of lower intensity and severity.

Forests outside of Natural Fire Interval

Based on a fire interval of 4 to 42 years, about 70 percent of the project area has missed one or more fire intervals, including forested areas adjacent to private lands. These stands consist of mid to large ponderosa pine with dense closed canopy understory conditions. These areas are at high risk for a stand-replacing wildfire, and represent a wildfire hazard to public safety and property. See **Figures 9 – 12**.

While these stands are well outside a natural fire interval, the CNF recognizes that these areas provide important habitat for a number of species, including the Northern Goshawk, which is a Management Indicator Species for old growth forest (Custer Forest Plan, page 18). Surveys completed during the 2011 field season documented that goshawks are actively and successfully

nesting in the 15 Mile watershed. A management objective of this project is to perpetuate diverse and sustainable habitats for goshawk and big game that are more resilient to wildfire.

Figure 9: Mature forest with a dense closed canopy. Photos by Matt Sonsteng (6.30.11)



Figure 11: Mature forest with a dense closed canopy. Photo by Andy Godtel (6.30.11)



Figure 10: Mature forest with a dense closed canopy. Photo by Matt Sonsteng (6.30.11)



Figure 12: Goshawk nest with 3 young in the 15 Mile watershed. Photo by Andy Godtel (6.30.11).



Managing for mature forest in a fire dependent ponderosa pine ecosystem presents a challenge. Habitat as shown in **Figures 9 - 12** above would not likely survive a stand replacement event. Strategic reductions in fuel loads around areas the CNF would like to protect (such as goshawk nesting areas) are needed to lessen the likelihood of a fire originating elsewhere from moving into these areas. Reduction of ladder fuels and limited tree thinning in mid aged and mature stands would also lessen the likelihood of a surface fire transitioning to a crown fire in these areas.

Improve the diversity and quality of hardwood draws and riparian/aquatic habitat

The project area contains a very small percentage of hardwood draws and riparian/aquatic habitat. Due to lack of routine fire and current management activities, ponderosa pine is outcompeting hardwood species in the draws. Removal of ponderosa pine from stagnated woody draws would allow aspen, green ash and other hardwood species to regenerate and increase diversity across the landscape. Riparian and aquatic habitat such as the Elk Creek Reservoir has primarily been used for livestock grazing and as a water source for livestock. Livestock exclosures and habitat restoration would improve habitat for riparian and aquatic dependent species, and potentially provide for a recreational fishery resource over time.

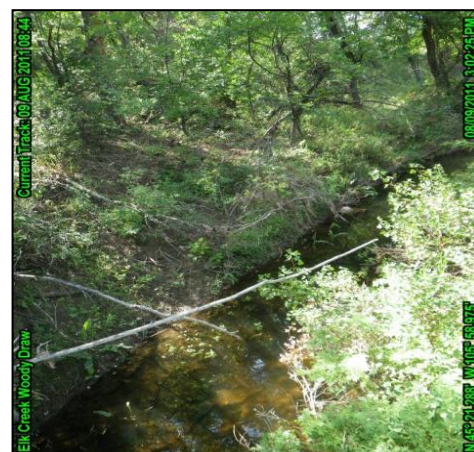
The need for woody draw and riparian/aquatic enhancement is supported by Forest Plan forestwide management direction to manage woody draws and riparian areas for water quality, provide diverse vegetation, and protect key wildlife habitat from conflicting uses (Forest Plan, page 3, 5, 18). Aquatic habitat restoration on Elk Creek Reservoir responds to forestwide management standards to maintain, develop, or create cold and warm water fisheries in suitable areas and make habitat improvements on reservoirs found suitable for fish habitat enhancement (Forest Plan, page 19).

Fifteen Mile and Elk Creek are the only perennial streams in the project area. Portions of the stream channels are entrenched and disconnected from their historic floodplain. Streamside vegetation in most areas includes cottonwood, green ash, and associated grasses such as prairie chord grass. Where canopy shade is present, surface water is open and clear (**Figure 14**). In contrast, where canopy shade is absent, surface waters contain high amounts of algae (**Figure 13**). The Forest has identified areas where riparian restoration would restore the connectivity of surface water flow throughout the drainage and over time potentially allowing the streams to access a historic floodplain. Hardened livestock crossings (gravel) will decrease the amount of sediment activated to the water column by hoof action. Increased canopy shading of the channel will decrease water temperatures and algae growth potentials, increase dissolved oxygen, and improve overall riparian function. Restoration work is needed to improve riparian and aquatic habitat.

Figure 13: Elk Creek: Note lack of herbaceous vegetation and presence of algae. Photo by Joe Vacirca (8.9.11).



Figure 14: Elk Creek: Note streamside vegetation and clear flowing water. Photo by Joe Vacirca (8.9.11)



The project area also includes 50+ intermittent or ephemeral drainages that serve as headwaters that ultimately flow into Otter Creek. Hardwood draw remnants exist to some degree in most of these tributaries (**Figures 15 – 17**). Species composition includes aspen, green ash, choke cherry, plum, and box elder or open grasslands with Hawthorne and plum. Hardwood vigor and regeneration is impeded by conifer encroachment and browsing in some areas. All of these drainages have the potential to support hardwoods, and there is a need to selectively thin conifers in all tributary draw bottoms to promote hardwood regeneration, vigor and expansion of existing hardwood stands. In addition, valley bottoms could also be planted with hardwood species to increase diversity and improve riparian function. Prescribed burning would further enhance vigor in treated areas.

Figure 15: Woody draw. Photo by Andy Godtel (6.30.11).



Figure 16. Woody Draw. Photo by Joe Vacirca (8.9.11).



Figure 17: Small clump of aspen in a woody draw. Conifers are suppressing aspen growth and vigor. Photo by Amy Waring (9.21.11).



Elk Creek Reservoir was constructed in the 1930s by the Civilian Conservation Corps (CCC). See **Figure 18**. The reservoir is currently used as a water source for livestock, and does not support robust riparian habitat or aquatic species. Riparian and aquatic habitat could be improved by providing an offsite water source for livestock, enclosing the reservoir to exclude cattle, increase the depth of the reservoir and plant riparian plants to provide habitat and shade. Successful habitat enhancement would provide habitat for native aquatic species. The Forest could evaluate the potential to introduce native fish to the reservoir. Ultimately, Elk Creek Reservoir could be developed and promoted as a recreation site that includes signage to interpret the historic context of CCC activities and achievements.

Figure 18: Elk Reservoir: Note lack of shoreline vegetative from livestock watering



Decommission roads in accordance with the 2009 Ashland Travel decision.

The purpose of Ashland Travel Management was to 1) identify routes for public motorized use, 2) provide for a mix of motorized and non-motorized opportunities, 3) minimize impacts on natural and cultural resources, and 4) have enforceable travel management guidelines that meet the direction of the 2005 Motorized Travel Management Rule. The need for travel management was the result of changes in land management policies, increased use and demand for recreation opportunities, new developments and improvements in recreation-related technology, and increased concerns about travel-related impacts to natural resources.

The travel decision identified routes for which there was no identified administrative, utilization or protection need as available for decommissioning in the future, subject to site specific NEPA analysis (Travel Management ROD, page 2-3). The purpose and need of road decommissioning in the 15 Elk Landscape Restoration Project is to complete the site specific NEPA analysis on previously identified routes within the project area, and determine the appropriate methods to close, decommission, and/or obliterate these routes.

Most of these routes are short, partially vegetated two-tracks across grasslands, and provide duplicate access to areas already served by other system routes. Some of the routes have completely re-vegetated and are barely visible. Two routes have existing or potential water quality issues (409412C/47841C at the NE end and 47835). Route closure signage is intact on some, but not all off the routes. Regardless of signage, many of these routes are still being used. **Figure 19** below is representative of a route that needs obliteration and restoration work.

Figure 19: Route 47845. Route identified for decommissioning.



Project Objectives

Specific objectives of the 15 Elk project include:

1. Improve forest stand health and condition by reducing tree densities, surface fuels, ladder fuels and crown canopy cover.
2. Perpetuate diverse and sustainable habitats for goshawk and big game that are more resilient to wildfire.
3. Increase fire resiliency throughout the project area by restoring unnaturally high fuel loads to a more natural balanced fuel load.
4. Create a diversity of stand conditions throughout the project area by managing for early development (post disturbance), mid development closed, mid development open, and late development open conditions.
5. Reduce the risk to private property in proximity to Federal lands in which conditions are conducive to a large-scale wildland fire disturbance event and for which a significant threat to human life or property exists (PRCWPP, 2004).
6. Enhance hardwood draws and riparian/aquatic habitat.
7. Decommission roads as identified in the Ashland Travel Plan.

Proposed Action

The proposed action includes a combination of vegetation and road management activities. Vegetation treatments would be accomplished using appropriate tools, such as hand thinning, mechanical fuels treatment, timber harvest, and/or prescribed burning to provide sustainable environmental, social, and economic benefits. Road management activities include maintenance

and reconstruction of existing roads, temporary road construction, temporary changes to route classifications, road decommissioning, and two corrections to route designations on the Ashland Motor Vehicle Use Map (MVUM). These activities are detailed below.

Vegetation Treatments

A combination of mechanical fuels treatments, hand thinning, and prescribed fire was considered to meet the purpose and need for the project and achieve desired stand conditions. Mechanical treatment, including the use of commercial logging and noncommercial treatment, mastication equipment and machinery are proposed as management tools to meet management objectives. The CNF proposed treatments based on a multitude of factors, including slope, aspect, stand densities, volume, access, ladder fuel components, crown cover, wildlife habitat needs, past management activities, and location on the landscape. The proposed action includes the following:

Table 1: Proposed Treatment

Treatment Type	Code	Acres
Commercial Timber Harvest		
Seed Tree with RXB. Cable logging.	ST	774
Shelterwood with RXB. Cable logging.	SH	109
Commercial Thin from below with Seed Tree openings ranging from 5 to 26 acres over 1/3 of treatment unit. Includes RXB. Tractor logging.	CT/ST	550
Commercial Thin from below with a Shelterwood openings ranging from 5 to 26 acres over 1/3 of treatment unit. Includes RXB. Tractor logging.	CT/SH	546
Combination Cut. Approximately 1/3 CT, 1/3 Liberation Cut (LIB), and 1/3 Noncommercial (NC). Includes RXB. Tractor logging.	CO	399
Total		2,378
Noncommercial Treatment		
Noncommercial – North Slopes. Includes mastication, hand thinning, and RXB.	NCN	1,905
Noncommercial – South Slopes. Includes mastication, hand thinning, and RXB.	NCS	1,981
Total		3,886
Noncommercial Treatment – Timber Stand Improvement		
North Slopes. Includes mastication, hand thinning, and pile burning. No broadcast burning.	TSI-N	418
South Slopes. Includes mastication, hand thinning, and pile burning. No broadcast burning.	TSI-S	64
Total		482
Prescribed Fire (RXB). Broadcast burn. No mechanical treatment. May include hand thinning prior to burning.	RXB	7,370
Valley Bottom Enhancement. Includes native plant planting and RXB.		75
Elk Reservoir Enhancement. Includes native plant planting, dredging to deepen reservoir, RXB, and livestock enclosure.		3
Hardwood Draws – Special Cut Combination of commercial and noncommercial treatment and RXB. Acreage overlaps other treatments, and is therefore not counted to sum up the total treatment.	SC	332
Total Treatment		14,194
No Treatment		10,708

Commercial treatment would be accomplished by tractor (approx. 1,495 acres) or cable logging (approx. 883 acres). Tractor logging with whole tree yarding would be completed during the summer under dry soil conditions, or in the winter on frozen ground or over snow. Cable logging is proposed on slopes greater than 30 percent, where tractor logging is infeasible.

Noncommercial treatments involve hand or mastication thinning from below, with treatment of fuel loads by a variety of methods including lop and scatter, jackpot and pile burning, or broadcast burning. Mastication may be used on areas where the slope is less than 30 percent. Based on a GIS query, mastication could potentially be used on approximately 1,567 acres on portions of units identified as noncommercial treatment.



Table 2 below describes in more detail the various prescriptions proposed and summarizes desired stand conditions. **Maps 3 - 5** depict the proposed action.


The CNF identified a 5000 acre territory around an existing goshawk nest in the 15 Mile watershed in Management Area D. The proposed action does not treat any land within the goshawk territory. The Forest is reviewing the accuracy of the Forest's VMap data prior to proposing any treatment in this area, and is specifically evaluating how canopy closure and tree size are consistent with best available science (Brewer et al 2009 and Reynolds et al 1992). Based on the results of this review, limited management activities such as prescribed fire, mastication thinning, hand thinning, and/or a thin from below that retains suitable wildlife habitat and creates small openings may be considered in the territory as an alternative to the proposed action.



Fuel loads in treatment units not adjacent to private lands would be reduced to a range of three to seven tons per acre. Fine fuel loads (0-3" diameter) would not exceed three tons per acre. Coarse Woody Debris (CWD) in the 3-12"+ diameter range would be retained when available, and at a minimum of four tons per acre.

Fuel loads in treatment units adjacent to private land would be reduced to a range of three to five tons per acre. Fine fuel loads would not exceed two tons per acre. CWD would be retained when available, and at a minimum of three tons per acre.

Table 2: Silvicultural Prescriptions

Code	Treatment Name	Treatment Description	Desired Stand Condition
Commercial Treatment			
CT	Commercial Thin	<p>Thin from below to promote healthy growing conditions. The best-formed, least disease/insect damaged trees and most vigorous trees will be left. Stand composition will depend on size and age classes present.</p> <p>Approximate post treatment average spacing, ages, canopy coverage, and diameters classes stand conditions where available are:</p> <p>Young Forests (40 to 80 years); 7 to 14" diameter; range of 125 to 200 trees per acre. Range of spacing between trees: 15 to 19 feet.</p> <p>Mid Aged to Mature Forest (80 to 150 years); 14" plus in diameter, range of 30 to 60 trees per acre. Range of spacing between trees: 27 to 38 feet.</p> <p>Canopy coverage range 20 to 30%, average 25%.</p>	<p>Late development open canopy stands post treatment. Open grown, predominately single story, variable spaced, healthy, productive ponderosa pine communities with limited ladder fuels and low canopy coverage. Canopy coverage ranges from 20 to 30%, average 25%.</p>
		<p>Figure 3: Representative Stand Before CT Treatment</p> 	<p>Figure 4: Representative CT treatment. Note structure in background that is not visible before treatment.</p> 

Code	Treatment Name	Treatment Description	Desired Stand Condition
CO	Combination of prescriptions, including: Liberation Cut (LIB) Commercial Thin (CT) Small Openings (SO) Precommercial Thin (PCT)	LIB: Overstory Removal Harvest and Thinning Activity – Remove overstory and thin out understory. CT: See above SO: Small 2 to 4 acre openings. PCT: Thin to leave the fastest growing, most disease free and damage-free trees.	LC: Promotes mid development open structure. Open grown, predominately single story, variable spaced, healthy, productive, ponderosa pine communities with limited ladder fuels and lower stocking densities to promote lower canopy coverage. CT: See above. SO: Create small openings ranging from 2 to 4 acres PCT: Post replacement development stands that will progress into mid open development stands. Open grown, predominately single story, variable spaced, healthy, productive, ponderosa pine communities with limited ladder fuels and lower stocking densities to promote lower canopy coverage.
SC	Special Cut	Release of the green ash or aspen by removing the overtopping and competing ponderosa pine trees. Remove all ponderosa pine within the perimeter of aspen stands. Remove 90 of ponderosa pine within the perimeter of green ash stands (maintain 10% of the pine component where available).	Removes competing ponderosa pine from green ash/aspen stands. Green ash communities with less than 10% ponderosa pine and aspen communities with no ponderosa pine communities.
SH	Shelterwood Seed Tree Cut	Stocking reduction for creating post disturbance stand conditions for pattern and structure diversity to alter landscape fuel conditions. Trees per acre greater than 9" diameter: 20 to 25 trees per acre of the largest, best formed, disease/insect free individuals, for purposes of seed production, protection of regenerating seedlings, and capturing good genetic traits for growth and yield. Average spacing between trees would approximate 42 to 47 feet. Canopy cover range 15 to 25%, average 20%.	Fully stocked post replacement stands that will progress through mid open and then late open development stand conditions. Open grown, predominately single story, variable spaced, healthy, productive ponderosa pine communities with limited ladder fuels and low canopy coverage. Canopy cover ranges from 15 – 25%, average 20%. Figure 5: Representative SH Treatment 

Code	Treatment Name	Treatment Description	Desired Stand Condition
ST	Seed Tree Cut	<p>Stocking reduction for creating post disturbance stand conditions for pattern and structure diversity to alter landscape fuel conditions. These areas occur predominately on moist aspects.</p> <p>Approximate post treatment desired average stand conditions where available:</p> <p>Leave trees per acre greater than 9" diameter: 12 to 14 trees per acre of the largest, best formed, disease/insect free individuals, for purposes of seed production and capturing good genetic traits for growth and yield.</p> <p>Average spacing between trees would approximate 55 to 60 feet.</p> <p>Canopy cover range of 5 to 15%, average 10%.</p>	<p>Fully stocked post replacement stands that will progress through mid open development and then to late open development stand conditions. Open grown, predominately single story, variable spaced, healthy, productive ponderosa pine communities with limited ladder fuels and low canopy coverage. Canopy cover ranges from 5 – 15%, average 10%.</p> <p>Figure 6: Representative ST Cut</p> 
Noncommercial Treatment			
NCN	<p>Noncommercial Thinning N</p> <p>Northern aspect</p>	<p>Thin from below in the 0 to 7" diameter class to remove ladder fuels to promote conditions conducive to prescribed fire, and maintain single story ponderosa pine communities.</p> <p>Approximate desired post treatment average stand conditions where available:</p> <p>Canopy cover range for trees greater than 7", 10 to 60%+.</p>	<p>Predominantly late development closed canopy stands. Predominately single story, variable spaced, healthy, ponderosa pine communities with limited ladder fuels and areas of higher stocking densities to promote high canopy coverage for wildlife habitat.</p> <p>Figure 7: Representative noncommercial treatment</p> 

Code	Treatment Name	Treatment Description	Desired Stand Condition
NCS	Noncommercial Thinning S Southern aspect	Thin from below in the 0 to 7" diameter to reduce ladder fuels and restore open grown large diameter ponderosa pine. These stands occur on southern, and/or dry aspects that naturally do not support high crown densities. These areas will be opened to resemble more naturally occurring conditions. Approximate desired post treatment average stand conditions where available: Canopy cover range of trees greater than 7", 10 to 55%.	Late development open canopy stands. Open grown, predominately single story, variable spaced, healthy, ponderosa pine communities with limited ladder fuels and lower stocking densities to promote low canopy coverage.
PCT	Precommercial Thin	Thin to leave the fastest growing, most disease free and damage-free trees. Approximate desired post treatment average stand conditions where available: Sapling size class (1-5" diameter) 125 to 260 trees per acre and pole size class (5-8" diameter) 125-200 trees per acre.	Post replacement development stands that will progress into mid open development stands. Open grown, predominately single story, variable spaced, healthy, productive, ponderosa pine communities with limited ladder fuels and lower stocking densities to promote lower canopy coverage.
SCNC	Special Cut Noncommercial Green Ash/Aspen enhancement with prescribed fire	Release of the green ash or aspen by removing the overtopping and competing ponderosa pine trees. Remove all ponderosa pine within the perimeter of aspen stands. Remove 90 of ponderosa pine within the perimeter of green ash stands (maintain 10% of the pine component where available).	Removes competing ponderosa pine from green ash/aspen stands. Green ash communities with less than 10% ponderosa pine and aspen communities with no ponderosa pine communities.
RXB	Prescribed Fire Prescribed fire without mechanical treatment. May include hand thinning prior to burning.	Prescribe burn to maintain and/or improve nonforest ecosystems and open grown ponderosa pine areas.	Maintain nonforest conditions with limited pine colonization. Late development open canopy stands in the forested stands. Open grown, predominately single story, variable spaced, healthy, ponderosa pine communities with limited ladder fuels and lower stocking densities to promote very low canopy coverage.
NT	No Treatment	none	Retains multilayered stand conditions for biological diversity.

Road Management Activities

Existing Road Maintenance or Reconstruction: All system routes used to facilitate commercial operations would receive either reconstruction, pre-haul maintenance; haul maintenance; post-haul maintenance or a combination thereof. Road maintenance activities may include where applicable: surface blading, dust abatement, slide removal and slump repair, surfacing repair, shoulder maintenance, ditch cleaning, maintenance of minor drainage structures, clearing roadway vegetation, cutting roadside vegetation, seeding, maintenance of major drainage structures, maintenance of miscellaneous structures, and maintenance of traffic signs. Road re-alignment activities may include some vegetation and incidental tree removal.

Temporary Roads: Approximately 33 miles of temporary road would be needed to access treatment areas. Temporary roads would be closed and obliterated after management activities are completed. Closure of temporary roads and obliteration would occur using a variety of methods such as scarifying/ripping, seeding (with native vegetation), signing, obstructing, and re-contouring slope where needed. Entrances to some temporary roads may be obliterated for a minimum distance of 100 feet or as needed to a length where the road cannot be seen from an open system road. Obliteration may consist of scarifying in a random pattern (not just parallel to the roadbed), restoring to contour if a cut-slope exists and scattering of debris (where available). Signing may or may not be required to keep vehicle traffic from using the route. Signing needs will be addressed as rehabilitation activities are completed.

Changes to Route Classification: The Ashland Travel Decision converted a number of motorized roads to motorized trails, including but not limited to Routes 4783, 4784, 47844, 47832, 47846, 40945, and 40947. They may be converted to a Maintenance Level 2 road for the duration of vegetation management activities. A Maintenance Level 2 Route is assigned to roads open for use by high clearance vehicles, and is suitable for log hauling. (Please refer to the glossary for a complete definition.) Upon completion of timber sale activities the roads would be converted back to their prior status as follows:

- The reconstructed road templates, including road junction improvements, would be retained in a manner that facilitates drainage.
- The road template would be lightly scarified and seeded to facilitate reestablishment of vegetation.
- Physical barriers such as gates, rocks, and logs or signs may be placed at the entrances of motorized trails open only to and maintained for motor vehicles less than 50 inches in width.

Road Decommissioning: The 15-Elk project area includes 15.36 miles of road segments that were recommended for decommissioning in the 2009 Ashland Travel Management decision. The Forest is currently evaluating methods to close, decommission, and/or obliterate these road segments. Methods may include, but are not limited to:

- Closing routes but maintaining the road surface for future administrative use
- Signing the route closed

- Scarifying/ripping in a random pattern (not just parallel to the roadbed)
- Diagonally ripping all or portions of the road prism
- Restoring to contour if a cut-slope exists
- Scattering debris, felling trees, and/or obstructing with boulders, stumps, or logs
- Seeding with a native, noxious weed free grass mix.

The routes listed in **Table 3** below are being reviewed for decommissioning, and are displayed on **Map 7**.

Table 3: Road Decommissioning Opportunities

Old Route No.*	Current Route No.	Miles
	40302	0.13
409410	4094101	0.64
	409412	0.62
	409412A	1.14
	409412B	0.48
	409412C	0.16
	409412D	0.65
40945	409414	0.62
	40945	0.74
	40945A	0.45
	40945B	0.34
	44243	0.33
	442431**	0.45
	47832A	0.28
	47833A	0.50
	47835	1.02
	47841A	0.36
	47841B	0.22
47841	47841C	0.21
47842	47843	1.31
	4784B	0.36
	47845	2.10
	47846A	0.42
	47846	1.16
	Spur off of 47846	0.40
	47847	0.27
		Total: 15.36

Note: *Several Route Designations were renamed post Travel Planning. The first column identifies route numbers as they were designated in the Travel Plan. ** Route 442431 is actually just north of the project boundary and was included due to its proximity to Route 44234.

Corrections to the Travel Plan: During a field survey conducted during the summer of 2011, the CNF noted an inconsistency between on the ground route designation and what was designed in the Travel Plan with respect to Route Numbers 4094101 and 40302. Route 4094101 is a cutoff route to 409410 and incorrectly posted as 409410 at the junction with Route 4094. The route is semi steep at the upper end with minor concentrated flow routes to 4094. Although posting this route as open is inconsistent with the Travel Plan, using this route to access Route 409410 makes sense as it eliminates approximately ½ mile at the east end of 409410. Some small wet areas appear to exist at the east end of 409410. The east end of 409410 is staked as closed to motorized vehicles (CMV) at the junction with 40302.

The Travel Plan kept Route 409410 open and closed 4094101. However, 40910 is signed closed, and 409101 as open. Approx. ½ mile of road can be eliminated by modifying the Travel Plan to reflect on the ground signage. Therefore the proposed action includes changing the Motor Vehicle Use Map (MVUP) to reflect on the ground signage (designating 409410 as open) and decommissioning a portion of Route 409410 on the east end.

Route 40302 is a cutoff route to Routes 4030 and 4030. The route is a gentle route through grassland with minor concentrated flow that is used to access Route 4030 more easily. It would be difficult to keep use off this open grassland area. The proposed action includes changing the MVUM to designate Route 40302 as an open road and be consistent with the on-ground signing.

Alternative and Analysis Issues / Project Design and Mitigation

Potential issues have been identified based on input from Forest Service resource specialists and previous public involvement and collaboration. The 15 Mile watershed includes an active goshawk territory that successfully fledged three young during the summer of 2011. The Forest Service anticipates public comment regarding goshawk and old growth forest management. Management of mid aged to old forest was identified as a Key Issue that is driving an alternative. Analysis issues will consider impacts to big game/habitat, water quality (including an assessment of whether there is a system of ditches or culverts and ditches that convey runoff to waters of the U.S.), and other resources such as Recreation, Heritage, Air Quality, Scenery, etc.

The CNF will review comments received from project scoping and identify other Key Issues and Analysis Issues. Analysis issues may typically be addressed through the development of design features and mitigation to avoid, minimize, and /or mitigate impacts. Design features and mitigation measures will be further developed, refined, and described in detail in the environmental impact statement and after scoping comments have been reviewed. Additional Key Issues could drive the development of a new alternative.

Custer National Forest Land and Resource Management Plan

The Project area includes lands designated Management Area D, G, B, (Map 6) as well as M, and N (Map 3). The Proposed Action would meet all applicable Forest Plan Forest-wide management goals, standards, and guidelines. The proposed action would meet specific Forest Plan Management Area direction, including, but not limited to the following:

Management Area D: 9,139 acres of the project area is within Management Area D (USDA 1986, p. 53-57). The goal for this management area is to maintain or improve the long-term diversity and quality of habitat for the selected species identified by the District Ranger as well as accommodating the other resource management activities such as timber harvest, livestock grazing, and oil and gas development. Some short term habitat impacts may be necessary to achieve long-term wildlife goals. This goal will be achieved through direct wildlife habitat improvement, as well as selecting, scheduling and implementation of cultural practices associated with other multi-resource management activities. Efforts will be made to avoid or mitigate resource conflicts. This management area contains lands considered suitable for timber management. Timber management activities will be guided by silvicultural prescriptions based upon stand examinations and wildlife analysis. Silvicultural prescriptions will identify timber treatments that will perpetuate or improve key wildlife habitat and livestock forage. Planned ignitions may be used for range improvement and wildlife habitat, timber stand maintenance, fuels reduction, sanitation, maintaining vegetation, and associated wildlife habitat dependent on periodic fire.

Management Area G: 4,723 acres of the project area is within Management Area G (USDA 1986, p. 64-66). The goal for Management Area G is to manage these areas for the maintenance and improvement of a healthy diverse forest and as a source of wood products for dependent local markets. Silvicultural systems will consider other resource needs such as wildlife habitat, visual impacts, and livestock management.

Management Area B: 14,530 acres of the project area is within Management Area B (USDA 1986, p. 45-48). The goal for Management Area B is manage these areas to provide for the continuation of livestock grazing, implementation of intensive range management systems and the facilitation of minerals and energy development with consideration of other resource needs. Emphasis will be to maintain existing fish and wildlife habitats. Forested areas will be managed to perpetuate or enhance livestock forage and wildlife habitat values. Management activities may include removal of wood products such as sawlogs, posts and fuelwood or transplant materials. Wildlife and range resources will be protected or enhanced.

Management Areas M and N: The Forest Plan did not map MAs M (riparian areas) and N (woody draws). These areas were mapped in the project area to identify potential woody draw and riparian enhancement (**Map 3**). The management area goals for both riparian areas and woody draws is to provide healthy, self-perpetuating plant and water communities that will have optimum diversity and density of under-story and over-story vegetation (USDA 1986, p. 80-85). The proposed action proposes treatment on approximately 75 acres of Valley Bottom Treatment, 3 acres of Elk Creek Reservoir Enhancement, and 332 acres of woody draw treatment.

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